



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,578	02/24/2005	Mike Muhl	WEM-07601	9309

26339 7590 01/04/2007  
MUIRHEAD AND SATURNELLI, LLC  
200 FRIBERG PARKWAY, SUITE 1001  
WESTBOROUGH, MA 01581

EXAMINER
----------

DESTA, ELIAS

ART UNIT	PAPER NUMBER
----------	--------------

2857

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/501,578

Applicant(s)

MUHL ET AL.

Examiner

Elias Desta

Art Unit

2857

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 2/24/2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 5, 8-13, 16, 17 and 23-25 is/are rejected.
- 7) ☒ Claim(s) 3, 4, 6, 7, 14, 15 and 18-22 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 February 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date February 24, 2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### *Detailed Action*

#### *Drawing*

1. The drawing is objected to because of the following minor informality:
  - Figs. 1 and 2. Label the unit blocks as to function.

#### *Claim Objection*

2. Claims 1, 5 and 10 are objected to because of the following minor informalities: the claims, which state that “the dielectric sensors which may be immersed in the fluid ...” is not a positive limitation. Claims 2-4, 6-9 and 11-15 are objected to the extent that they rely on objected base claims.

Claim 10: the acronym: NTC resistor and PTC resistor should be defined before their use.

Appropriate correction is required.

#### *Claim rejection – 35 U.S.C. 112*

3. Claims 23-25 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are:

In reference to claim 23: the claim is directed to “a method for determining a property of a fluid” and yet the subsequent steps noted in the claim are short of “determining a property of a fluid”. Applicant did not show the step that establishes the property of the fluid sought after. The

Art Unit: 2857

differential signal or output is one aspect of the process to determine the property of the fluid but does not represent the outcome of the claimed subject matter per se.

*Claim rejection – 35 U.S.C. 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) The invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims 1, 2, 5, 8-13, 16, 17, 23, 24 and 25 are rejected under 35 U.S.C. 102(a) as anticipated by *Blendonck et al.* (IEEE Article, 'Application of an Intelligent Dielectric Sensor for Soil Water Content, Electrical Conductivity and Temperature' hereon *Blendonck*).

In reference to claims 1, 5, 16, 17, 23 and 24: *Blendonck* teaches a measuring system for determining a property of fluid (water) from a dielectric property of the fluid (see *Blendonck*, page 1817, abstract, page 1818, section II, 1<sup>st</sup> paragraph). The system includes:

- First sensor for measuring an electric capacitance (see *Blendonck*, page 1818, 2<sup>nd</sup> column, paragraph 1);
- Second sensor is designed as a dielectric sensor which is immersed in a fluid (water) and has a stray-field capacitor (formed due to the capacitance of the field complex impedances of the sensors,  $Z_1, \dots, Z_n$ , which include capacitance values (see *Blendonck*, page 1818, 2<sup>nd</sup> column, paragraph 3). The second sensor is

designed as a temperature sensor, which is immersed in water (fluid) (see

Blendonck, page 1819, 1<sup>st</sup> column, 2<sup>nd</sup> paragraph).

With regard to claim 2: Blendonck further teaches that the first (capacitive) and second (temperature) sensors are each connected to an analyzer device which assigns a value of the property to be determined to a measured temperature value and measured capacitance value or dielectric calibration data (see Blendonck, page 1819, 2<sup>nd</sup> column, 1<sup>st</sup> paragraph).

With regard to claim 8: Blendonck further teaches that the measuring capacitor is formed by the plurality of flat printed conductors in the form of inter-digital capacitor because the sensor electronics is formed or implemented in ASIC and the sensors directly connect to a microprocessor (see Blendonck, Fig. 7 and page 1818, 1<sup>st</sup> column, last paragraph).

With regard to claims 9 and 18: Blendonck further teaches that the printed conductors in the sensor system are printed on an insulating substrate by thin film or thick film method because the conductors as noted in Figs. 4 and 7 are developed on printed circuit board where all the active elements are built in the ASIC.

With regard to claim 10: Blendonck further includes a temperature sensor in the form of a temperature sensor element because the complex impedance  $Z$  ( $C_x$ ,  $R_x$ ) provides a measure of dielectric properties where temperature is one of the three parameters exploited (see Blendonck, page 1820, Fig. 4).

With regard to claim 11: Blendonck further teaches that the temperature sensor is connected to the dielectric sensor to form a structural unit because in Fig. 4 the dielectric calibration data is fed to the total impedance to form the correction values for the capacitance

values which also includes dielectric properties, such as temperature in a structured form to provide user conversion routine (see *Blendonck*, page 1820, Fig.4).

With regard to claims 12 and 13: *Blendonck* further teaches that the feeder line leading to the temperature sensor is applied to the insulating substrate in the form of printed conductors (see *Blendonck*, page 1819, Fig. 3,  $C_{ref}$ ,  $R_{ref}$ , and  $C_p$  &  $R_p$ , and Fig.7,  $Z_{1a,b}$ ....  $Z_{4a,b}$ , page 1821, 1<sup>st</sup> column, and 1<sup>st</sup> paragraph; Complex impedance consist of sensors needed to obtain temperature readings).

With regard to claim 25: *Blendonck* further teaches that system includes a compensation method for errors introduced into the measured values because the system consists of a calibration routine (see *Blendonck*, Fig. 6).

### *Allowable Subject Matter*

6. Claims 3, 4, 6, 7, 14, 15 and 18-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### *Conclusion*

7. The prior art made of record and not relied upon is considered pertinent to applicant disclosure:

- a. *Chmiel et al.* (U.S. Patent 5,269,175) teaches sensor for investigating liquids.
- b. *Raymond* (U.S. Patent 4,510,436) teaches dielectric measuring system.

Art Unit: 2857

- c. Hannan et al. (U.S. Patent 6,138,508) teaches digital liquid level sensing apparatus.
  - d. Hetzel (U.S. Patent 5,423,206) teaches fluid flow apparatus with capacitive sensors.
  - e. Dammig, Jr. et al. (U.S. Patent 3,639,835) teaches capacitive tank gauging apparatus being independent of liquid distribution.
  - f. Mano et al. (JOTAAC Article, 'Temperature Calibration in a Dielectric Measurements') teaches the method of comparing three different calibrations based on detection of transitions or relaxations where the method is used to construct a calibration curve for a given heating rate.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elias Desta whose telephone number is (571)-272-2214. The examiner can normally be reached on M-Th (8:30-7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (571)-272-2216. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/501,578

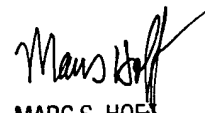
Page 7

Art Unit: 2857

Elias Desta  
Examiner  
Art Unit 2857

- E.d.

- December 13, 2006



MARC S. HOFF  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800